(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 238 780**
A1

(12) EUROPEAN PATENT APPLICATION

(21) Application number: 86850032.3

(51) Int. Cl.⁴: F24C 15/20 , B01D 45/08

(22) Date of filing: 03.02.86

(43) Date of publication of application:
30.09.87 Bulletin 87/40

(84) Designated Contracting States:
BE DE FR GB IT NL

(71) Applicant: **Futurumverken AB**
Box 9
S-93047 Byske(SE)

(72) Inventor: **Hedman, Per-Martin**
Falmyrvägen 22
S-931 53 Skelleftea(SE)
Inventor: **Wallin, Sven-Olov**
Markvägen 10
S-934 00 Kage(SE)
Inventor: **Eriksson, Gunnar**
Lundfors 3440
S-930 47 Byske(SE)

(74) Representative: **Kierkegaard, Lars-Olov et al**
H. ALBIHNS PATENTBYRA AB Box 7664
S-103 94 Stockholm(SE)

(54) A filter assembly intended for extractor fans in domestic ovens.

(57) The present invention relates to a filter assembly for oven extractor fans of the kind which include air deflecting devices extending along the air-intake ports of the filter assembly, these devices comprising mutually off-set rows of pin-like elements extending at right angles to the bottom plane of the filter assembly.

In accordance with the invention the filter assembly (4) comprises a bottom plate (8) and a top plate (7) which extends along the front edge and the side edges of the bottom plate and has a width at least sufficient for the top plate (7) to cover the rows of air deflecting devices (10), such as to form air-intake channels (9, 11) together with corresponding parts of the bottom plate. The air-intake opening along the front side of the filter assembly comprises a slot (11) located between the bottom and top plates and extending along the whole of the front side of the filter assembly (4), and the air-intake ports located along the sides of the filter assembly (4) comprises slots (9) formed in the bottom plate, the undersurface of the bottom plate lying flush with or inwardly of the underside of the extractor hood.

The invention provides a filter assembly in which the air-intake opening thereof located on the front side, placed in the width direction of the oven, has maximum length. In addition, all air-intake channels are arranged in the actual filter assembly itself, which facilitates cleaning of the assembly.

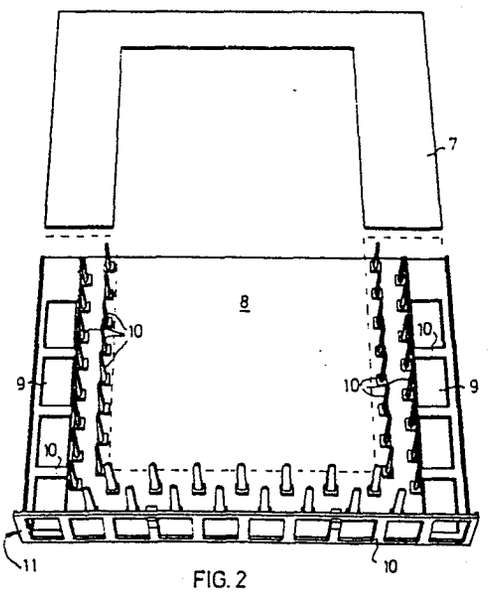

FIG. 2

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A filter assembly intended for extractor fans in domestic ovens

The present invention relates to a filter assembly which is intended for use in domestic oven extractor fans which is of the kind which incorporates along the air-intake openings or ports of the filter air-deflecting devices in the form of mutually off-set rows of pin-like elements projecting towards the bottom plane of the filter.

Such filter assemblies, so-called labyrinth filters, have long been known in the art and are renown for the ease in which they kan be cleaned. Such filters are not prone to become clogged or blocked, which is an additional, significant advantage.

The filtering function of filters of this kind is achieved by causing the air drawn into the filter to impinge against air-deflecting devices and, in so doing, release the droplets of grease entrained therewith, the air being unable to retain these droplets when decelerated as a result of impact against the air-deflecting devices.

A known labyrinth filter assembly is arranged to project out from the undersurface of the oven fan-extractor. This filter assembly is square in shape and has identical air-intake ports on all four sides thereof, therewith ensuring uniform air flow.

A further known filter assembly, of similar construction, is described and illustrated in Swedish Lay-out Print 353 142 and has air-intake ports provided on three sides. Since the bottom surface of this filter assembly lies flush with the undersurface of the oven extractor-fan, the hood of the oven extractor-fan must also be provided with openings which communicate with the air-intake ports located in the sides of the filter assembly.

Another known labyrinth filter assembly has air-intake ports arranged along solely the front edge of the filter assembly.

An object of the present invention is to provide a filter assembly of the aforesaid kind which has air-intake ports provided along three sides thereof and lies flush with or inwardly of the defining edge of the undersurface of the extractor hood, and which is so formed as to avoid the necessity of providing air-intake openings in said hood.

A further object of the invention is to form the air-intake ports and the air-deflecting devices in a manner which provides a favourable air-flow, at the same time as the port or opening through which air is drawn into the filter assembly has a maximum length across the oven.

These objects are achieved with a filter assembly of the aforesaid kind having the characteristic features set forth in Claim 1. By placing the lateral air-intake ports in the bottom plate, there is obtained a front air-intake of maximum length, at the same time as the denser arrangement of the air-deflecting devices along the side edges of the bottom plate ensures a favourable flow of air through the air-intake ports.

These and other advantages will be more apparent from the following detailed description of an exemplifying embodiment of a filter assembly according to the invention, made with reference to the accompanying drawings, in which

Figure 1 illustrates an extractor fan for domestic ovens, incorporating a filter assembly according to the invention, this view being seen from obliquely beneath the extractor fan; and

Figure 2 illustrates the filter assembly according to the invention, obliquely from above and with the top-plate removed.

The oven extractor-fan illustrated in Figure 1 includes a fan wheel provided with a horizontal drive-shaft and enclosed in a vermiform housing 1, as indicated by broken lines in Figure 1. The fan housing is surrounded by an oven fan-extractor hood 2 which is fitted with lights 3 along the short sides thereof. Located between the lights 3 is a filter assembly 4, which is fitted into a recess in the hood 2 so that the bottom surface of the filter assembly lies flush with the undersurface of the hood. The filter assembly 4 is supported by the extractor hood 2 by causing the rear edge of the filter assembly to rest on a lower flange provided on the hood, and by engaging two resilient latching hooks projecting from the front edge of the filter assembly behind an inwardly folded edge of the upper defining side of an opening or recess in the extractor hood 2. The filter assembly can thus be detached readily from the extractor fan, by swinging the assembly down about its rear edge and then disengaging the hooks from the aforesaid recess defining edge, whereafter the assembly is moved obliquely downwards and forwards, until the rear edge no longer rests against the lower flange of the extractor hood.

As will be seen from Figure 1, the fan extractor includes an adjustable front screen 5 which can be swung out from the extractor hood, so as to increase the extent at which fumes rising from the front part of the oven are taken into the extractor. The extractor hood also has arranged thereon a panel 6 with switches for operating the fan and the aforesaid lighting.

Figure 2 illustrates the filter assembly 4, with the top plate 7 removed therefrom. The outer defining surfaces of the top plate coincide with the outer defining surfaces of the bottom plate. The position taken by the inner defining surfaces of the top plate 7 when fitted to the filter assembly is shown

in broken lines in Figure 2, and it will be seen that the top plate covers the inner rows of air-deflecting devices 10. Although not shown, the top plate 7 has a recess formed in the front side thereof, to facilitate inward bending of the aforesaid latching hooks on the filter assembly 4. The top plate is referably arranged so as to be readily removable from the remainder of the filter assembly, to enable the assembly to be cleaned more easily.

Arranged along the side edges of the bottom plate 8 are air-intake slots 9 through which air is drawn by suction and which are provided with a plurality of pin-like deflector devices 10. Arranged between the top and bottom plates of the filter assembly along the front thereof is further air-intake opening in the form of a slot 11, which also incorporates air deflecting devices 10.

Two further rows of air-deflecting devices extending perpendicularly from the bottom plate are arranged along the three air-intake slots. The flow of air through the front air-intake slot 11 is substantially parallel with the channel formed by the bottom plate 8 and the top plate 7, and subsequent to passing through the channel it is deflected upwardly by the inner defining surface of the top plate, towards the fan air-intake slot through which air is drawn into the fan. The deflecting devices 10 located in the air-intake slot are thus equally as effective as the deflecting devices located in the two rows of deflecting devices extending vertically along the front edge of the bottom plate, the deflecting devices 10 in respective rows of deflecting devices being equally spaced one with the other, and the three rows being spaced at mutually the same distance apart.

The air flows drawn in by suction the side intake-slots 9 of the bottom plate 8 move in a substantially vertical direction and are deflected to a horizontal flow direction in the side channels formed by the bottom and top plates. Because the deflecting devices 10 in the air-intake slots 9 are at right angles to the rows of deflecting devices arranged in the bottom plate, these devices in the flow path of the incoming air, which describes a curved path between the deflecting devices in the air intake slots and the deflecting devices incorporated in the first row of deflecting devices in the bottom plate will be located along their lengths at mutually different distances from corresponding locations of the deflecting devices in the rows on the bottom plate. In addition, the deflecting effect behind an air-deflecting device will decrease relatively quickly, and hence the residual deflection effect of that part of the indrawn air-flow striking the upper part of the deflecting devices in the first row of devices on the bottom plate is small. This means in principle that the upper parts of the deflecting devices located along each side of the filter assembly must provide the same filtering effect as the three rows of deflecting devices located along the front edge of the filter assembly. In order to achieve this, the deflecting devices present in the rows extending along the sides of the bottom plate are placed closer together than the deflecting devices present along the front edge of the bottom plate, and as close as possible to the air-intake slots provided in the bottom plate.

It will be understood in this respect that the assumingly symmetrical curved path of the air flow in the side channels solely constitutes an ideal picture of the flow pattern, and that many factors influence the air-flow, such as the intake flow, the velocity of the air, and the interference between deflected air flows. The ideal pattern of air-flow, however, is sufficient to illustrate qualitatively that the extent of the co-action between the deflecting devices located in the intake slots and the deflecting devices located on the bottom plate will decrease in correspondence with increasing distances between corresponding locations in the flow path.

Because the deflecting devices along the sides of the bottom plate have been placed closer together in the rows than the deflecting devices located along the front edge, their relative flow resistance will be greater. Consequently, in order to achieve the same intake velocity in all intake slots or ports, the intake slots located along the sides of the filter assembly are narrower than the air-intake slots located along the front side thereof, and are also provided with fewer deflecting devices per unit of length.

The invention thus provides a filter assembly which has air-intake slots provided along the front edge and both sides thereof. Because the side intake slots are formed in the bottom plate, it is no longer necessary to provide side intake ports in the extractor hood, which means in turn that the air-intake slot along the front of the filter assembly can be made longer, so as to cover a greater part of the width of the oven than was previously possible. Cleaning of the extractor fan is simplified by the fact that all air-intake channels are formed in the readily removed filter assembly. Cleaning can be further simplified to a small extent, by providing the bottom plate with upstanding side walls, although the benefit afforded hereby from a cleaning aspect is very slight, since the greater part of the grease droplets are separated from the air on the deflecting devices. In the case of fan extractors not provided with a front screeen, it may be preferable to provide a separate air entrance chamber beneath the bottom plate, which can be readily done with the filter assembly according to the invention, by placing the filter assembly at a distance from the underside of the extractor hood and inwardly thereof.

It will be understood that the invention is not restricted to the described and illustrated embodiment and that modifications can be made within the scope of the invention, such as modifications to the form and positioning of the deflecting devices and the integral manufacture of the top plate with the remainder of the filter assembly. The assembly shall therefore solely be limited to the scope of the following claims.

Claims

1. A filter assembly for use with fans, particularly oven extractor fans, and being of the kind which incorporate air-deflecting devices along the air-intake ports of the filter assembly, said devices comprising mutually off-set rows of pin-like elements (10) projecting upwardly from the bottom plane of the filter assembly, characterized in that the filter assembly (4) includes a bottom plate (8) and a top plate (7) which extends along the front edge and the side edges of the bottom plate and has a width at least sufficient for the top plate (7) to cover the rows of air deflecting devices (10) such as to form air-intake channels (9, 11) together with corresponding parts of the bottom plate; in that the air-intake port along the front of the filter assembly comprises a slot (11) located between the bottom and the top plate and extending along the whole of the front side of the filter assembly; and in that the air-intake ports along the sides of the filter assembly are in the form of slots (9) formed in the bottom plate; and in that the undersurface of the bottom plate (8) lies flush with or inwardly of the undersurface of the oven extractor hood (2).

2. A filter assembly according to Claim 1, characterized in that the slots (9) in the bottom plate are narrower than the slot (11) between the top and bottom plate.

3. A filter assembly according to Claim 2, characterized in that the distance between the first row of air deflecting devices (10) and respective air-intake ports (9, 11) is smaller at the sides of the filter assembly (4) than at the front edge thereof.

4. A filter assembly according to any of the preceding claims, characterized in that the distance between the air deflecting devices (10) in said rows is smaller at the sides of the filter assembly than at the front edge thereof.

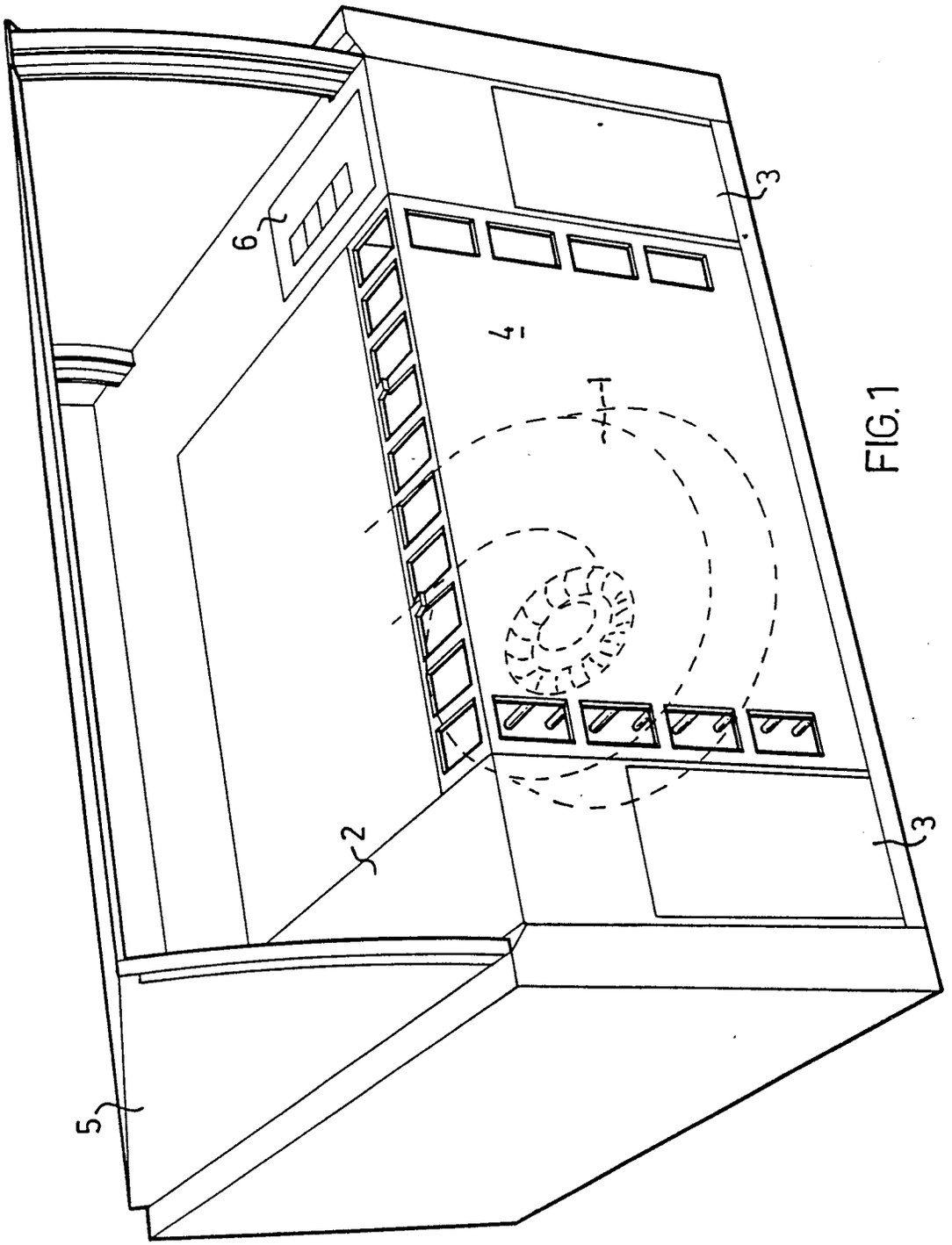

FIG.1

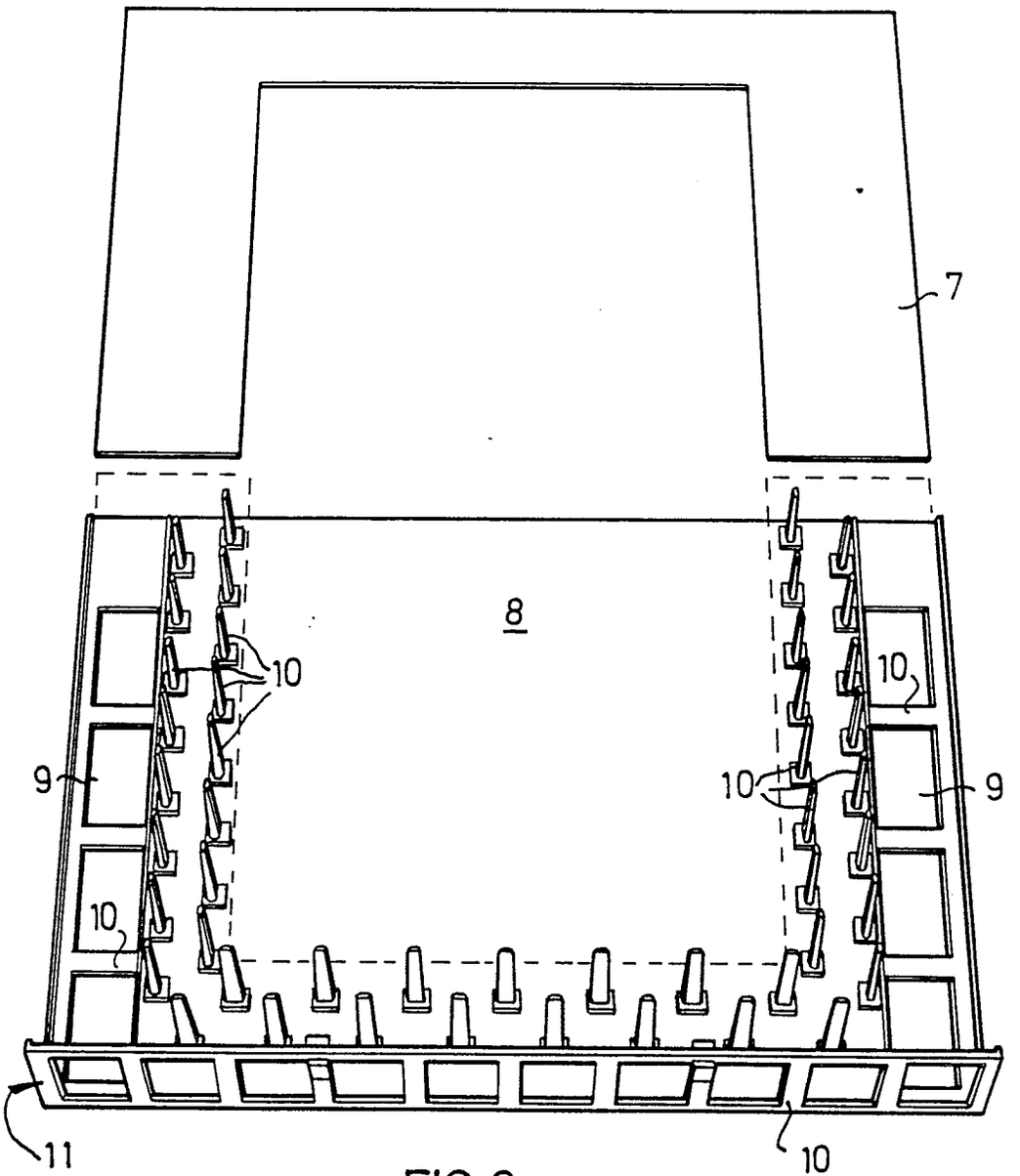

FIG. 2

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 86 85 0032

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	FR-A-2 397 217 (BOSCH-SIEMENS HAUSGERÄTE GmbH) ---		F 24 C 15/20 B 01 D 45/08
A	FR-A-2 317 597 (GAGGENAU-WERKE, HAUS- UND LUFTTECHNIK GmbH) -----		

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

F 24 C
B 01 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	30-10-1986	PYFFEROEN K.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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